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**Proposed Extension,
MUGA, Silkstone Community Facilities Hub, A628, Silkstone**

Noise Assessment Report

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**On behalf of
Silkstone Parish Council**

**Prepared by
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1.0 INTRODUCTION

- 1.1 Blue Tree Acoustics was commissioned by Silkstone Parish Council to carry out an environmental noise assessment relating to the proposed extension of the existing MUGA (multi-use games area) at Silkstone Community Facilities Hub, located behind the Co-op store and petrol station on the A628, Silkstone, as shown in Figure 1.
- 1.2 The development proposal is to create an extension to the existing MUGA, as shown in Figure 2.
- 1.3 The MUGA is used by the community, encouraging families and children to partake in sporting activities. The MUGA is not locked, and may be used by the community as they wish. There may be times when the MUGA is used by a group such as the scouts or a youth football team for training purposes.
- 1.4 The surrounding area is mixed in nature with nearby residential and commercial areas in the proximity, together with the existing MUGA and car parking areas.
- 1.5 The noise impact assessment has included:
 - i) Inspection of the site and surroundings.
 - ii) Review of outline plans of the proposed development provided by the Client.
 - iii) Noise monitoring surveys undertaken at locations on the site.
 - iv) Consideration of noise control measures required to maintain acceptable noise levels at the nearest dwellings with reference to *British Standard 8233: 2014, 'Guidance on sound insulation and noise reduction for buildings'* (BS8233:2014).

2.0 EXISTING NOISE SOURCES

Road

- 2.1 The site is situated behind the Co-op store and petrol station on the A628. The A628 is a well-trafficked road connecting Barnsley to Manchester via Penistone.
- 2.2 Cone Lane passes the site to the east, and also carries a reasonable volume of traffic between Silkstone Common and Silkstone.
- 2.3 Distant, as well as local, road traffic noise is clearly discernible in the vicinity of the existing dwellings.

Industrial/Commercial Premises

- 2.4 The carpark serving the Co-op store generates noise, as does the petrol station part of the operation. The car wash facilities also generate noticeable noise levels, as experienced to the rear of the dwellings fronting onto Cone Lane.

3.0 NEW NOISE SOURCES

- 3.1 The new development is fundamentally an extension of the existing MUGA site. The existing site is open for the public to use between dawn and dusk. Typically, the use does not extend beyond 2130 hours, and the lights are switched off at that time in any case. Similarly, it is unlikely that the site would be used as the sun rises. More commonly, the site is used between 0900- 2130 hours.
- 3.2 When the existing MUGA is used, the noise generated is of relatively low level and consists of voices, shoes interacting with the floor, and balls striking the surrounding MUGA framework.
- 3.3 The new MUGA extension will increase the number of people using the space, and will bring some of the noise sources closer to the dwellings. It is considered that 24 people using the space is likely to be the upper limit, but that it is more likely that around 15 use the site at a time. Clearly, there will be large periods of the day when the site is not in use at all.
- 3.4 Potentially, there will be noise produced at times during the construction of the development. However, this will be restricted to daytime hours only, and can be controlled by an appropriately worded planning Condition if needed.

4.0 NOISE SURVEY

- 4.1 Noise monitoring was undertaken by Blue Tree Acoustics in order to determine the existing ambient noise climate at the site.
- 4.2 Attended external noise measurements were taken on Wednesday 10th August 2016 and Wednesday 17th August 2016.
- 4.3 The measurements were taken at accessible locations on the development site at the approximate position of the proposed development, as indicated in Figure 1.
- 4.4 The instrument used during the surveys was 1no Rion NA-28 Type 1/Class 1 Integrating Sound Level Meter. The meter was within a valid period of laboratory calibration. Calibration checks were carried out both before and after the measurements, with no variance observed. A proprietary environmental windshield was fitted to the microphone. Measurements were made with the microphone mounted on a tripod at approximately 1.5m from local ground level.
- 4.5 Weather conditions throughout the survey periods were mainly dry and calm.
- 4.6 The dominant noise source at the development site was found to be road traffic from the surrounding streets, together with Co-op carpark noise and noise from the car wash facilities. The car wash facilities are the most significant noise source impacting on the rear elevation of the existing dwellings, but as they are intermittently used, this data has not been used to determine the existing ambient noise level climate at the dwellings.
- 4.7 The measurement results are detailed in Appendix II.

5.0 NOISE ASSESSMENT

- 5.1 In order to protect residents against the impact of potential future noise, the guidance given in *British Standard 8233: 2014, 'Guidance on sound insulation and noise reduction for buildings'* (BS8233) should be considered. The table below sets out the range of levels recommended in BS8233 for residential accommodation.

Table 1: BS8233:2014 Guidance Criteria for Indoor Ambient Noise Levels

Activity	Location	0700-2300 hours	2300-0700 hours
Resting	Living rooms	35 dB L_{Aeq} (16 hour)	-
Dining	Dining room/area	40 dB L_{Aeq} (16 hour)	-
Sleeping (daytime resting)	Bedroom	35 dB L_{Aeq} (16 hour)	30 dB L_{Aeq} (8 hour)

- 5.2 BS8233:2014 does not stipulate any criteria for maximum noise levels within rooms in terms of dB L_{Amax} , but does state that:

"Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values."

- 5.3 It is noted that BS8233:2014 also states that, where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5dB and reasonable internal conditions still achieved.
- 5.4 The levels shown above are based on the existing guidelines issued by the WHO, and assume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern (for example, on a road serving a port with high levels of traffic at certain times of the night), an appropriate alternative period (e.g. 1 hour) may be used, but the level should be selected to ensure consistency with the levels recommended in the table. These levels are based on annual average data, and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year's Eve.
- 5.5 BS8233 states that for traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$, which would be acceptable in noisier environments. BS8233 also recognises that these guideline values are not achievable in all circumstances where

development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.

- 5.6 Considering the data gathered at Location 2, 8 children (with residual noise) generated 54.2dB L_{Aeq} at approximately 10m (the actual distance ranged from 2m to 24m). The residual level was 48.5dB L_{Aeq} , giving a source sound level of 52.8dB L_{Aeq} allowing for the distance from 10m to the dwellings. At 50m, the sound level becomes 38.8dB L_{Aeq} . This assumes 8 children playing at an average distance of 50m from the dwellings. If three times the number of players were playing at a distance of 50m, the level would be no more than 44dB L_{Aeq} . Assuming the location of the activity were 35m rather than 50m, the level would become 47dB L_{Aeq} .
- 5.7 Considering the data gathered at Location 1, 8 children (with residual noise) generated 52.1dB L_{Aeq} at approximately 22m (the actual distance ranged from 15m to 36m). The residual level was 50.5dB L_{Aeq} , giving a source sound level of 47.0dB L_{Aeq} allowing for the distance from 22m to the dwellings. At 50m, the sound level becomes 39.9dB L_{Aeq} . This assumes 8 children playing at an average distance of 50m from the dwellings. If three times the number of players were playing at a distance of 50m, the level would be no more than 45dB L_{Aeq} . Assuming the location of the activity were 35m rather than 50m, the level would become 48dB L_{Aeq} .
- 5.8 Considering data collected both at Location 1 and Location 2, it is considered reasonable to assume that operation of the new MUGA extension would not generate a noise level higher than 50dB L_{Aeq} at the nearest dwelling.
- 5.9 Ambient noise levels measured in the vicinity of the nearest dwellings in the absence of activities taking place at the MUGA are presented in Appendix II. At midday, noise levels were found to be around 52dB L_{Aeq} . At the most critical time in terms of potential noise impact (between 2100-2200 hours), ambient noise levels were found to be 50dB L_{Aeq} .
- 5.10 If summed with the MUGA-related 50dB L_{Aeq} , the non MUGA-related 50dB L_{Aeq} measured during the evening would result in a noise level of 53dB L_{Aeq} at the nearest dwellings. It is considered that, for the vast majority of the time, the MUGA site will generate a noise level of the order of 40dB L_{Aeq} rather than 50dB L_{Aeq} , and thus the resultant noise level at the dwellings will remain unchanged.

- 5.11 Noise levels of up to 55dB L_{Aeq} are common, and are deemed acceptable in residential areas. It is considered that the noise impact of the proposal is minor, and that the use of the site will not impact on residential amenity by way of noise.
- 5.12 Resulting noise levels will remain below 55dB L_{Aeq} at the nearest dwellings.

6.0 SUMMARY AND CONCLUSIONS

- 6.1 A noise assessment has been carried out on behalf of Silkstone Parish Council for a proposed extension of the existing MUGA, Silkstone Community Facilities Hub, A628, Silkstone, S75 4NG.
- 6.2 The assessment has included measurements of the prevailing ambient noise levels at the site during representative daytime and evening periods.
- 6.3 Potential for noise impact from the new MUGA extension has been considered. Given the magnitude and character of the prevailing noise climate around the site, including from existing Co-op carpark and petrol station, the noise impact from the proposed MUGA extension is not considered likely to have a detrimental effect on residential amenity.
- 6.4 Road traffic, carpark, and petrol station noise were found to be the dominant noise source at the site during daytime, with car wash activities being particularly noticeable when in operation.
- 6.5 The site can be considered suitable for the proposed development, as acceptable noise levels in accordance with BS8233 criteria will be met.

FIGURE 1 – SITE & MEASUREMENT LOCATIONS

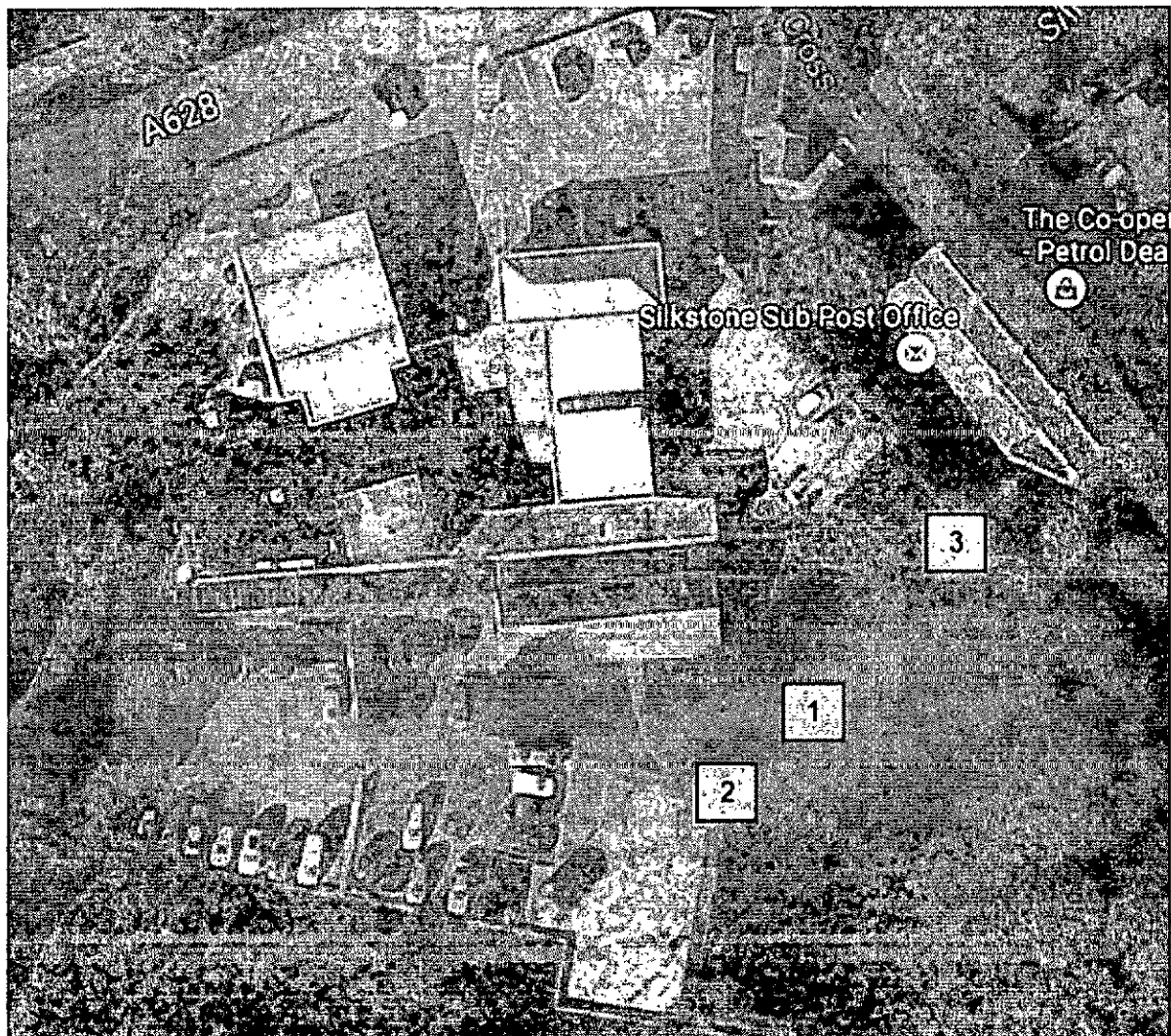
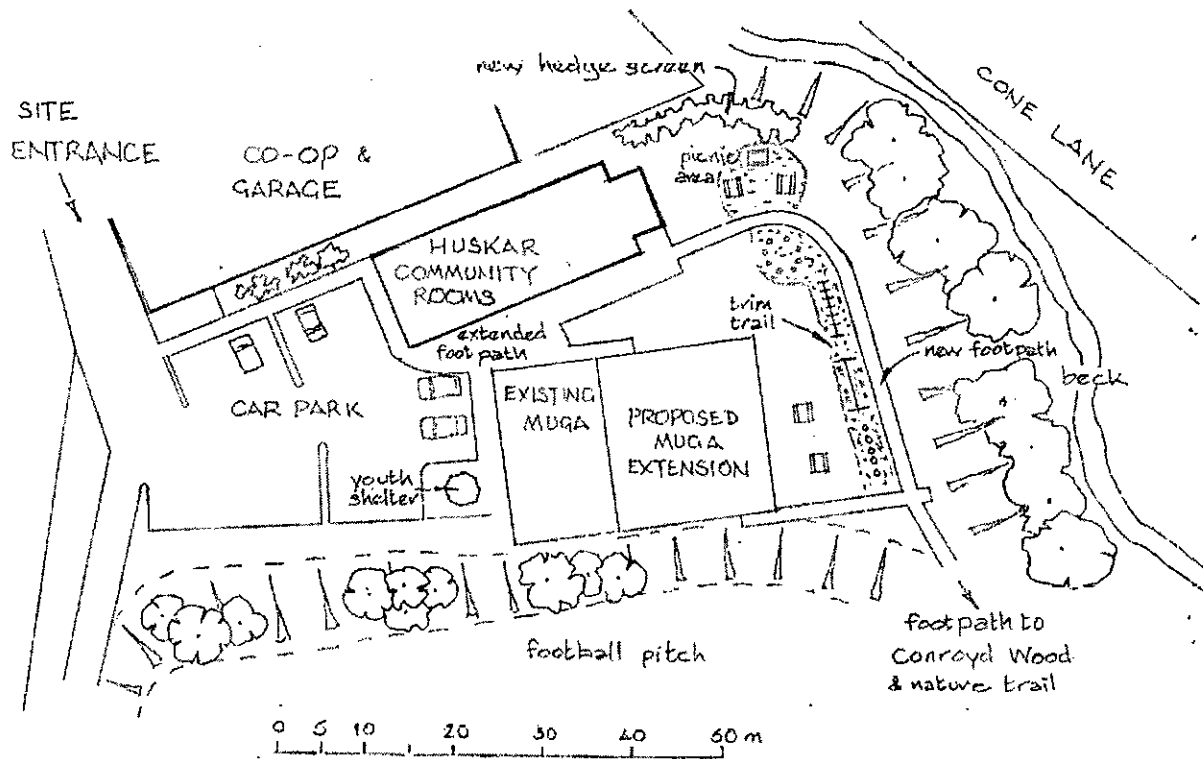


FIGURE 2 – PROPOSED LAYOUT PLAN



SILKSTONE COMMUNITY FACILITIES HUB

Scale c. 1:500
Drawn P.D.S. 02/16

APPENDIX I – NOISE UNITS AND INDICES

a) Sound Pressure Level and the decibel (dB)

A sound wave is a small fluctuation of pressure in air. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. Due to the wide range of pressure variations detectable by the ear, a logarithmic scale is used to convert the values into manageable numbers. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120 dB (threshold of pain).

b) Frequency and Hertz (Hz)

Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or Hertz (Hz). Sometimes large frequencies are often written as kilohertz (kHz), where 1kHz = 1000Hz. Young people with normal hearing can hear frequencies in the range 20Hz to 20kHz. However, the upper frequency limit gradually reduces as a person gets older.

As the ear hears some frequencies better than others, the A-weighting scale is used to mimic human hearing. A-weighting applies a correction to the sound level at a given frequency depending on how well the ear hears that frequency.

c) Glossary of Terms

In order to describe noise where the level is continuously varying, a number of other indices, including statistical parameters, are used. The indices used in this report are described below.

L_{Aeq} This is the A-weighted equivalent continuous sound level which is an average of the total sound energy measured over a specified time period. In other words, L_{Aeq} is the level of a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period.

L_{Amax} This is the maximum A-weighted sound level that was recorded during the monitoring period.

L_{A90} This is the A-weighted sound level exceeded for 90% of the time period. L_{A90} is used as a measure of background noise.

L_{A10} This is the A-weighted sound level exceeded for 10% of the time period and is often used in the assessment of road traffic noise.

L_{A1} This is the A-weighted sound level exceeded for 1% of the time period.

SEL This is the Single Event Level which is used to calculate the resultant L_{Aeq} which would be generated by a number of events with a given SEL. The SEL is the total energy measured over the event, compressed into 1 second. $SEL = L_{Aeq} + 10\log(t)$ where t is time in seconds. Also $L_{Aeq} = SEL - 10\log(t) + 10\log(n)$ where t is time in seconds and n is the number of events in the time period. SELs are often used for Train noise calculations and other specific events.

APPENDIX II – NOISE SURVEY DATA**Wednesday 10th August 2016 & Wednesday 17th August 2016**

All values dB(A), 15-minute duration unless noted, free-field positions. Measurements cut short as required in order to measure a single operational state. Instrumentation used was 1no Rion NA28 Sound Level Meter. Weather was dry and calm.

Location 1 – Approximately 15m from existing MUGA

Date	Time	L _{Aeq}	L _{Amax}	L _{A10}	L _{A90}	Comment
10/08/16	10:07	51.8	70.2	53.8	44.9	8 children playing on MUGA, road traffic noise and petrol station noise dominant.
10/08/16	10:52	52.1	70.3	54.6	46.2	8 children playing on MUGA, road traffic noise and petrol station noise inc car wash dominant. (9 min measurement)
10/08/16	11:02	48.6	62.6	51.6	43.2	8 children playing on MUGA, road traffic noise and petrol station noise dominant. (3 min measurement)
10/08/16	11:06	50.5	63.6	53.4	45.8	Road traffic noise and petrol station noise dominant. (4 min measurement)
10/08/16	11:11	49.4	69.7	51.7	42.8	3 children playing on MUGA, road traffic noise and petrol station noise dominant. (2 min measurement)
10/08/16	11:15	52.9	72.6	54.8	46.1	4 children playing on MUGA, road traffic noise and petrol station noise dominant. (10 min measurement)
10/08/16	11:25	56.5	81.2	57.1	45.4	6 children playing on MUGA, road traffic noise and petrol station noise inc car wash dominant(11 min measurement).
10/08/16	11:37	49.6	65.5	51.9	42.8	Road traffic noise and petrol station noise dominant. (11 min measurement)

Location 2 – Edge of existing MUGA

Date	Time	L _{Aeq}	L _{Amax}	L _{A10}	L _{A90}	Comment
10/08/16	10:36	54.2	77.8	56.4	44.1	8 children playing on MUGA, road traffic noise and petrol station noise audible.
10/08/16	11:48	48.5	67.6	50.8	41.8	Road traffic noise and petrol station noise dominant. (9 min measurement)

Location 3 – Near residential location

Date	Time	L _{Aeq}	L _{Amax}	L _{A10}	L _{A90}	Comment
10/08/16	11:58	51.8	64.1	54.5	45.3	Road traffic noise and petrol station noise dominant.
17/08/16	21:12	50.7	73.2	54.0	41.0	Road traffic noise and petrol station noise dominant.
17/08/16	21:27	49.7	63.3	53.7	40.2	Road traffic noise and petrol station noise dominant.
17/08/16	21:42	49.3	60.7	53.1	41.0	Road traffic noise and petrol station noise dominant.